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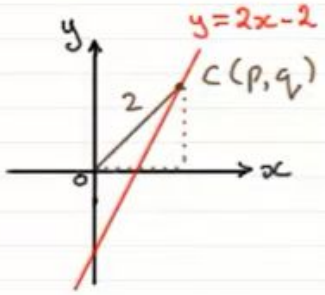
Equation of perpendicular bisector | Past Paper Question | P1 CIE Nov 2013 Q7(ii)

The point A has coordinates $(-1, 6)$ and the point B has coordinates $(7, 2)$.

(i) Find the equation of the perpendicular bisector of AB, giving your answer in the form $y = mx + c$. [4]

(ii) A point C on the perpendicular bisector has coordinates (p, q). The distance OC is 2 units, where O is the origin. Write down two equations involving p and q and hence find the coordinates of the possible positions of C. [5]



when $x = p, y = q$

$\therefore q = 2p - 2$ ①

Also $OC = 2$

$\therefore OC^2 = 4$

$\therefore p^2 + q^2 = 4$ ②

Sub ① into ②

$\therefore p^2 + (2p-2)^2 = 4$

$\therefore p^2 + 4p^2 - 8p + 4 = 4$

$\therefore 5p^2 - 8p = 0$

$\therefore p(5p - 8) = 0$

$\therefore p = 0$ or $5p - 8 = 0$

$\therefore p = 0$ or $p = 8/5$

Sub in ①

$\therefore$ when $p = 0$, $q = -2$

when $p = 8/5$, $q = 2(\frac{8}{5}) - 2 = 6/5$

$\therefore C(0, -2)$ or $C(8/5, 6/5)$

With the acknowledgement of Exam Solutions.

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